Math 250: Algebraic Structures for the Elementary School Teacher I
Fall Semester, 2008
M,W,R,F 12-12:50 in WS 3616

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Office Hours:	M & W 1-2; M, W, & F 10-11; or by appointment

Brief Description of the Course:

This course is designed to examine the structures underlying the algebraic reasoning of elementary school mathematics. We will use units from a reform-oriented middle grades (6^{th} to 8^{th}) curriculum as our starting point. These will provide both insight into current pedagogy and content at that level. However, we will go deeper into the mathematics to examine the underlying structures.

Prerequisite: A "C" or better in MA 151.

Course Objectives:

Much of the course will be devoted to engagement in *doing mathematics*. In large part, mathematics is about abstraction and generalization. Solving individual problems by themselves is not learning mathematics. After solving one or more problems, students (at every age and grade level) must think about and use what they learn in that process to extend their understanding of mathematics in general. This is done through analyzing methods of solution--what worked & why, what didn't work and why not. I hope that you develop a new perspective on (and, for many, a new appreciation for) mathematics. Through this process, I expect you will develop new perspectives on the teaching of mathematics.

While I hope you will find the course helpful in thinking about teaching mathematics, this is a **mathematics** content course and NOT a methods course.

Textbooks and Materials required:

There are four required texts (student edition) published in 2006 by Prentice Hall and authored by Lappan, Fay, Fitzgerald, Friel, and Phillips:

- Thinking with Mathematical Models
- Growing, Growing, Growing
- Frogs, Fleas, and Painted Cubes
- Say It with Symbols

A scientific calculator. This is *required* for all in-class tests and quizzes. **Do NOT expect to borrow a calculator from me or from a classmate—you will not be permitted to do so.**

Student Responsibilities:

- Attend every class session. Roll will be taken daily. The in-class activities are essential for developing a deeper mathematical understanding which is not developed by merely reading the text or looking at someone else's notes.
- Do all reading and problem assignments--both those to be turned in and those recommended (you will be responsible for concepts, conventions, and language presented in both types of assignments **even if not covered directly during class**).
- Allocate study time. Studying involves more than merely doing assignments. You should also spend time outside of class thinking about lectures & in-class activities. What made sense? What didn't? If X is true for this case, why is it (not) true for another case? Do these ideas extend to similar objects? & so forth.
- Work with other members of the class. While you will generally turn in individual assignments, I STRONGLY ENCOURAGE you to work on them with others.
- Be willing to "think outside the box." Be willing to try things that may not work. As the saying goes, we learn from our mistakes.
- If you have questions, ask them--in class, in office hours, or via e-mail. I'm not good at answering questions that are not asked.
- When I ask questions in class, volunteer your ideas. Students who participate in class--whether the mathematics in their ideas turns out to be right or wrong--generally do better than students who remain silent. There is NO penalty for wrong answers during class discussions.
- Appropriate Classroom Laptop Use: Although laptops in class open up new learning possibilities for students, sometimes students utilize them in ways that are inappropriate. No instant messaging, e-mailing, surfing the Internet, playing games, writing papers, doing homework, etc. during class time. Acceptable uses include taking notes and working on assigned in-class activities, projects, and discussions that may be enhanced by laptop use. It is easy for your laptop to become a distraction to you and to those around you. Inappropriate uses will be noted (silently) and will result in loss of a grade in participation points. If you use your laptop during class, at the end of the class period you will be expected to email me the notes you typed in class (I will not ask for them but will keep records of those who do/do not.).

Assessment:

Some form of assessment will take place most every week. Forms of assessment include: collected homework, announced/pop quizzes, and tests. Homework will be turned in at the start of class on the due date. Homework is to be done **neatly** and completed on a **clean** sheet(s) of paper. There will be three (3) in-class tests and a cumulative final. ***Tentative*** dates for the tests are: Sept. 19, Oct. 9, & Nov. 7. The cumulative final exam is scheduled for Thursday, Dec. 11, from 12-2:00. All material in the course is cumulative and once covered in class or assigned is fair game for any test or quiz.

You will be graded on classroom participation. A participant not only attends class every day (and arrives on time), but is prepared and actively contributes to learning activities. It is your responsibility to notify me in advance if you are unable to attend. Absences and tardiness negatively affect your grade. Absences due to medical reasons require a note from your health care provider.

The lowest Homework and lowest Quiz grade will be dropped. No make-ups or late work on Homework or Quizzes will be allowed. A make-up for a missed test will be given *only* under exceptional circumstances and with my *prior* approval.

Homework (5 @20 pts each)	80 points
Quizzes (5 @ 20 pts each)	80 points
Tests (3 @ 100 pts each)	300 points
Cumulative final	200 points
Participation	40 points

Grading Scale

A	93-100 percent	A-	90-92 percent	B+	88-89 percent	B	83-87 percent
B-	80-82 percent	C+	77-79 percent	C	70-76 percent	C-	67-69 percent
D	60-66 percent	E	below 60 percent				

Note: If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Disability Services Office by: coming into the office at 2001 C. B. Hedgcock; calling 227-1700; or e-mailing disserv@nmu.edu. Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.